

What is Claimed Is:

1. A method of sensing a touch, comprising the steps of:
  - providing an AC power source having a line input and a line neutral;
  - providing an isolated power supply connected to the AC power source and having a DC voltage source output;
  - referencing the DC voltage source reference to ground;
  - connecting an impedance limiting circuit to the output of the DC voltage source;
  - connecting an analog-to-digital converter to the impedance limiting circuit; the analog-to-digital converter having a waveform output;
  - connecting a processor to the analog-to-digital converter;
  - connecting a touch sensor to the impedance limiting circuit; the touch sensor capable of being touched by a body part;
  - capacitively coupling the touch sensor to the AC power source;
  - monitoring the waveform output with the processor;
  - calculating and saving the waveform output as an OFF reference waveform when the touch sensor is not being touched and the waveform output is stable;
  - indicating lack of contact with the touch sensor by the body part when the waveform output is less than 2 times the OFF reference waveform; and
  - indicating contact of the touch sensor by the body part when the waveform output is more than 2 times the OFF reference waveform.
2. The method of Claim 1, further comprising the steps of:
  - calculating and saving the waveform output as an ON reference waveform when the touch sensor is being touched and the waveform output is stable;
  - indicating lack of contact with the touch sensor by the body part when the waveform output is less than  $1/10^{\text{th}}$  of the ON reference waveform.

3. The method of Claim 1, further comprising:
  - indicating lack of contact with the touch sensor by the body part when the waveform output is less than 3 times the OFF reference waveform; and
  - indicating contact of the touch sensor by the body part when the waveform output is more than 3 times the OFF reference waveform.
4. The method of Claim 1, wherein the step of capacitively coupling the touch sensor to an input of the AC power source includes connecting a first capacitor between the line input of the AC power source and a metal plate and connecting a second capacitor between the line neutral to the metal plate.
5. The method of Claim 4, wherein the first capacitor and the second capacitor are of the Y-type and each about 330 pF.
6. The method of Claim 1, further comprising the step of:
  - indicating when a body part has stopped touching the touch sensor when the waveform output is less than 1/3 of the OFF reference waveform.
7. The method Claim 1, wherein the AC power source is between about 90 and 264 AC volts.
8. The method of Claim 1, wherein the frequency of the AC power source is between about 47 and 63 Hz.
9. The method of Claim 1, wherein the analog-to-digital converter is a voltage controlled oscillator.
10. The method of Claim 1, wherein the step of saving the waveform output as an OFF reference waveform includes the step of auto-correlating adjacent data segments in the waveform output.
11. The method of Claim 1, further comprising the step of:

continuously calculating and saving the OFF reference waveform when the touch sensor is not being touched by the body part.

12. The method of Claim 1, further comprising the step of:

providing a power transformer; and

doubling the line input of the AC power source with the power transformer.

13. The method of Claim 1, wherein the step of detecting a stable fundamental frequency waveform when the touch sensor is not being touched is carried out upon powering on the power supply.